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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/694,597	10/27/2003	Osamu Sekiguchi	27391/US589	3511

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EXAMINER

BIRENBAUM, NIRA S

ART UNIT PAPER NUMBER

1742

DATE MAILED: 10/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/694,597

Applicant(s)

SEKIGUCHI ET AL.

Examiner

Nira S. Birenbaum, Ph.D.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 June 2004.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-7 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10-27-03 & 6-1-04.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 3 -7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mooij *et al.* (US Patent No. 5,861,091) in view of Bard *et al.* (*Electrochemical Methods* John Wiley and Sons, New York: 1980; pp. 16-17), and further in view of applicant's admitted prior art.

Regarding claim 1, Mooij *et al.* teach a method for dissolving zinc comprising bringing a source of zinc ions (the anode) and a zinc dissolution accelerating metal (the cathode) into electrical contact with each other, thus creating a galvanic cell. (See Figure 14 and column 4, line 58 - column 5, line 33). Regarding claim 3, Mooij *et al.* teach that the anode and cathode are placed in different vessels and connected by a wire (see Figure 14).

However, this reference does not teach the step of shaking, vibrating or rotating the anode and cathode in order to accelerate zinc dissolution. Bard *et al.* teach that the rate of an electrochemical reaction is dependent on mass transfer variables such as convection, *i.e.*, stirring (Figure 1.3.2, pg. 17).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Mooij *et al.* by shaking, vibrating, or rotating the

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electrodes in order to stir the electrolyte, because Bard *et al.* teach that stirring can affect the rate of an electrode reaction (in other words, the dissolution of zinc can be accelerated by stirring). Furthermore, it would have been obvious to use the galvanic cell of Mooij *et al.* as a source of zinc ions for a plating bath, because applicant admits that galvanic cells have been used as sources of zinc for plating baths in the prior art (paragraph 5, background section).

Regarding claim 4, Mooij *et al.* teach that the source of zinc ions (anode) is pure zinc and that the zinc dissolution accelerating metal (cathode) is iron, which is more electropositive than zinc (see example 6).

Regarding claims 5 and 6, Mooij *et al.* do not teach that the degree of contact of either the anode or the cathode with the electrolyte is controlled in response to the zinc ion concentration.

Bard *et al.* teach that the rate of an electrochemical reaction is affected by the surface area of the electrode (Figure 1.3.2, pg. 17). Changing the degree of contact between the electrodes and the electrolyte would change the effective surface area of the electrode because a larger or smaller portion of the electrode's surface would be exposed to the electrolyte. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mooij *et al.* by controlling the degree of contact between the electrodes and the electrolyte, in order to control the rate of zinc dissolution as taught by Bard, and thereby adjust the zinc ion concentration.

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Regarding claim 7, Mooij *et al.* teach that the source of zinc ions (anode) is pure zinc (see example 6).

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mooij *et al.* in view of Bard *et al.* as applied to claim 1 above, and further in view of Holland (US Patent No. 1,511,967).

Mooij *et al.* and Bard *et al.* teach the features as previously described. However, these references do not teach that the anode and cathode are placed in the same vessel and brought into direct contact with each other.

Holland teaches that galvanic cells can be set up so that the anode and cathode are in direct contact with each other (column 1, lines 33-44). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mooij *et al.* in view of Bard *et al.* by placing the anode and cathode in the same vessel and bringing them into direct contact as disclosed by Holland, because Holland teaches that the galvanic current will flow whether the metals are in direct contact or connected by a wire (column 1, lines 40-44).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nira S. Birenbaum, Ph.D. whose telephone number is (571) 272-8516. The examiner can normally be reached on M-F 8:00 am - 4:30 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

nsb

ROY KING   
SUPERVISORY PATENT EXAMINER  
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